



**Statement of Carl Zichella
Director of Western Transmission
Natural Resources Defense Council
Before the Little Hoover Commission
February 28, 2012
Sacramento, California**

These comments are offered on behalf of the Natural Resources Defense Council (NRDC). NRDC is a national, non-profit organization of scientists, lawyers, and environmental specialists, dedicated to protecting public health and the environment. Founded in 1970, NRDC serves more than one million members, supporters and environmental activists, some 250,000 of whom live in California. We have offices in New York, Washington, Los Angeles, San Francisco, Chicago and Beijing. NRDC has a long history of efforts to protect and conserve the nation's natural resources, including in particular the nation's air, water and lands and resources managed by federal agencies. We also have a long history of advocacy promoting the increased use of energy efficiency and renewable energy sources to meet America's energy needs both at the national level and in various states, including California. And because we also recognize that some new transmission will be needed in order to significantly increase our use of renewable energy, we have engaged in transmission planning and policy making over the last several years. For example, we participated intensively in California's path-breaking Renewable Energy Transmission Initiative and play a leadership role in regional transmission planning in both the eastern and western interconnections, as well as providing advocacy leadership before federal agencies including the Federal Energy Regulatory Commission, and the Departments of Energy, Agriculture and Interior.

NRDC believes that the goals of increased reliance on renewables and protection of our nation's unique and sensitive places are not necessarily in conflict.

Introduction

California is blessed with an extraordinary richness of renewable energy resources. High quality and low cost renewable energy sources in other western states are also available to California to assist with the attainment of both climate protection and renewable energy procurement goals. California has the potential, with adequate transmission in place, to export renewable power to neighboring states helping to balance renewable resources across broad geographic regions and reduce the need for fossil back-up generation to "smooth out" the variability of renewables. California's continued leadership as well as its participation in broader regional planning could help provide progress on renewable energy on a national scale.

There are steps that we can take now to improve the State's ability to take full advantage of these resources:

- Provide adequate transmission infrastructure;
- Establish a centralized authority for transmission planning and operations to ensure coordinated planning, permitting, siting and system control
- Require operational coordination and balancing between all five California balancing area authorities (BAAs)
- Facilitate stakeholder participation in a single statewide transmission planning process
- Integrate California into broader regional planning

Some of these factors (planning and siting) have been and are being addressed through innovative programs pioneered in California, such as Renewable Energy Transmission Initiative, or “RETI” and the current federal-state Desert Renewable Energy Conservation Plan (DRECP), while others have proven to be politically difficult. This memorandum seeks to highlight and recommend, from NRDC’s perspective, solutions and actions to foster a more efficient, reliable and economic grid

Solutions needed to address these issues include:

1. Greater coordination of transmission planning and approval bodies, via a transmission and operations Planning Authority, especially the CPUC and CAISO, as well as public utilities, especially the Los Angeles Department of Water and Power.
2. State policies and administrative actions facilitating the siting of generation and transmission projects on disturbed lands and less ecologically sensitive lands, as identified in renewable energy zones.
3. Retention of a strong point person in the Governor’s office to drive federal-state, and intra-state agency cooperation on siting and permitting and facilitate stakeholder participation.
4. Timely completion of the DRECP.
5. Preserve stakeholder participation opportunities for transmission (such as RETI).
6. Create a leadership role for California in reciprocal western energy markets.

Transmission adequacy

California, with a peak energy demand of approximately 50,000 Mw, is the largest consumer of electricity in the Western Interconnection. The Western Interconnection is a synchronized electric grid that spans 1.8 million square miles from the Canadian provinces of British Columbia and Alberta, to the northern part of Baja California, Mexico. The Western Interconnection covers all or most of 11 states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming), and portions of three states (South Dakota, Nebraska, and Texas). This area is within the planning area for the Western Electricity Coordinating Council, whose primary mission is to identify and suggest system changes to relieve congestion as well as to enforce reliability standards established by the North American Electricity Reliability Council (NERC), which is in turn supervised by the Federal Energy Regulatory Commission (FERC). In 2005, peak summer demand for electricity in the Western Electricity Coordinating Council area was 149,147 MW. Though demand has essentially remained flat due to the current recession (and California’s already advanced energy efficiency programs), forecasts predict significant additional growth across the West, complicating California’s efforts to curtail the emission of greenhouse gases to meet the mid-century climate goals specified by AB 32.

Transmission capacity is constrained from east to west in southern California, somewhat constrained in northern California in the same directions, and is constrained south to north in the state. Relieving this congestion could allow for the distribution of renewable energy resources both in state and out of state to all markets in California, reducing our consumption of fossil fuels substantially.

Analysis done by Black and Veatch for the Renewable Energy Transmission Initiative (RETI) indicates that developable California renewable energy resources far exceed not only our peak electricity demand (by an order of magnitude), but are so plentiful as to exceed our ability to design transmission for them. After federal tax policy, the California Public Utilities Commission has identified lack of available grid transfer capacity as the leading obstacle to renewable energy development in the state.

But California is also extraordinarily rich in biological and habitat diversity, and enjoys a protected land and wildlife network that is among the most important in the world for a single jurisdiction. California has the second highest level of species endemism in the nation trailing only Hawaii in native diversity. Californians are among the most environmentally minded in the country and our body of environmental laws is the strongest in the nation and by extension perhaps the world. These riches and the public consensus for protecting them make siting a difficult challenge. Moreover, preserving ecological options for climate adaptation is also an important state goal. This means planning for generation, transmission and habitat conservation should involve environmental stakeholders early on and be done contemporaneously for the best results both in terms of project location, as well as public acceptance. Until the institution of the RETI process, the top-down transmission planning approach limited transmission upgrades and development in California, leading to congestion and a lack of transfer capacity for renewable energy resources which are more remotely constrained than conventional generation.

Garamendi Principles

In 1988, recognizing both the growing importance of transmission with the interconnection of independent power producers and the escalating conflicts between transmission-owning and transmission-dependent utilities, the California Legislature passed Senate Bill (SB) 2431 (Stats. 1988, ch. 1457), which contained the following findings concerning the role of transmission in California's future development:

(a) The Legislature finds and declares that establishing a high-voltage electricity transmission system capable of facilitating bulk power transactions for both firm and

Non-firm energy demand, accommodating the development of alternative power supplies within the state, ensuring access to regions outside the state having surplus power available, and reliably and efficiently supplying existing and projected load growth, are vital to the future economic and social well being of California.

(b) The Legislature further finds and declares that the construction of new high-voltage transmission lines within new rights-of-way may impose financial hardships and adverse environmental impacts on the state and its residents, so that it is in the interests of the state, through existing licensing processes, to accomplish all of the following:

1. Encourage the use of existing rights-of-way by upgrading existing transmission facilities where technically and economically justifiable.
2. When construction of new transmission lines is required, encourage expansion of existing rights-of-way, when technically and economically feasible.
3. Provide for the creation of new rights-of-way when justified by environmental, technical, or economic reasons, as determined by the appropriate licensing agency.
4. Where there is a need to construct additional transmission, seek agreement among all interested utilities on the efficient use of that capacity.

Transmission lines are never welcome developments, but locating lines in existing corridors and making best use of existing infrastructure can reduce opposition. In fact one line employing these principles (Blythe-Devers) has drawn explicit support from environmental groups while another, Tehachapi, has drawn only limited local opposition on only one of its 11 segments (Chino Hills). In contrast, poor and top-down siting for Sempra's original Sunrise Powerlink project, which would have bisected California's largest state park, Anza Borrego, led to fierce public opposition, forcing the project to be re-routed, and causing a delay of years

in the project's completion. Similarly, LADWP's Greenpath North project – routed across ecologically-sensitive desert as opposed to within existing corridors – ran into a buzz saw of public opposition and eventually had to be abandoned by the utility. These failures illustrate the need for another, more inclusive approach.

Recommendation: Create a RETI-like stakeholder process to guide input into statewide transmission planning.

California's RETI process provided a first-of-its-kind effort to include environmental and other nontraditional stakeholders in transmission planning. The project included regulators, utilities, environmentalists, renewable energy generators, Native American and consumer representatives and federal land managers in a transparent public process to identify viable renewable energy development zones to which transmission lines could be optimally developed with less environmental impact. The project utilized the Garamendi principles as core guidance in making transmission recommendations (see sidebar, above).

It has become a national model of stakeholder participation, imitated by the Western Governors Association's Western Renewable Energy Zone (WREZ) process as well as making its way into federal legislation (Reid, S539 and Bingaman, S1462) and DOE contracts for regional transmission expansion planning in both eastern and western interconnections. In the West interconnection-wide transmission planning is coordinated by the WECC and WGA. FERC transmission planning rules (Orders 890 and 1000) also feature broad stakeholder participation.

Most importantly, RETI results have been influential in identifying transmission upgrades that would best serve renewable development and helped identify cases where duplication of transmission proposals by Public (POUs) and Investor-owned (IOUs) utilities both increased costs and environmental impacts of proposals to specific parts of the state.

RETI developed recommendations that regulators use in forming transmission plans of service. Strong stakeholder participation in the planning processes of the POUs, CPUC and CAISO will be difficult to manage without some official process in which stakeholders enjoy a level playing field. One way to enable this would be requiring a centralized transmission planning stakeholder process to officially inform transmission planning across all load serving entities in California.

Recommendation: Establish a California Transmission Planning Authority. Require coordination between and among transmission planning, siting and approval processes to avoid duplication of transmission proposals, optimize grid performance, reduce costs, avoid environmental impacts and create an integrated state transmission plan.

California's transmission system is encumbered by built-in inefficiencies and jurisdictional competition. Correcting this problem could save ratepayers hundreds of millions of dollars in avoided transmission construction costs, reduce needed reserve margins, provide better operational characteristics and reliability, and avoid contentious and destructive environmental siting problems. Ideally, California's transmission grid should operate as a single integrated system, taking best advantage of the generation characteristics of both renewable energy and traditional generation to lower costs, provide flexibility generation, increase reliability, prevent unneeded construction while limiting fossil backup for operating reserves. Coordinating the transmission regulators and the five balancing authorities in the state would help us make

better decisions about truly needed and appropriately located transmission improvements with fewest environmental conflicts. Doing so could lead to the development of an integrated state transmission plan that would provide the least cost, most reliable way to meet California's renewable energy and greenhouse gas reduction goals, now and into the future.

Transmission planning in California has many players with often competing interests and jurisdictional rivalries. POU and IOU compete for markets and have often insisted on their own transmission networks, ostensibly for reliability reasons. POU ardently avoid CAISO control and fear that ISO control could lead to blackouts in their jurisdictions in times of emergency. The CAISO – the only nominal regional transmission organization in the western US – only has direct jurisdiction over IOUs. The CPUC similarly approves rates and construction for IOU transmission projects, but not POU. CAISO approves transmission proposals and sets tariffs as well as managing interconnection requests from generators of all stripes.

While there is communication between and among these players, and recently a greater willingness to plan together, as evidenced by the California Transmission Planning Group (CTPG) which has run scenarios on transmission solutions based on RETI transmission outputs and rankings, and ISO-CPUC consultations, the separation and duplication of transmission planning and operation remains a major problem. There are indications that state agencies have recognized this problem and though lacking executive leadership are moving to coordinate better. The means for this has been the establishment of the inter-agency California Clean Energy Future collaboration, which involves the CPUC, Energy Commission, Air Resources Board, and CAISO. This collaboration could provide a platform for coordination, if there was a single director or driver to coordinate goals, and develop as part of its mission a coordinated state transmission plan.

A coordinated system should reduce duplicative reviews and provide a net reduction in time and effort for project applicants.

A way to improve this situation would be to establish a Transmission Planning Authority to direct coordinate and synchronize the processes of the California Clean Energy Future agencies and oversee POU-IOU coordination, and vet proposals with a broad range of stakeholders via the centralized stakeholder process mentioned above. The chair of this Board could be appointed by the Governor and housed at the CEC, utilizing existing staff from the CEC and CPUC. This board should be charged with developing a binding statewide transmission plan.

Seven states have established Transmission Infrastructure Authorities with varying levels of state-determined powers. The table below illustrates these entities and their statutory powers.

Location:

Seven states have created state authorities that are focused on promoting and facilitating transmission infrastructure planning and development.

- ▶ Wyoming Infrastructure Authority (WIA, 2004)
- ▶ Idaho Energy Resources Authority (IERA, 2005)
- ▶ Kansas Electric Transmission Authority (KETA, 2005)
- ▶ North Dakota Transmission Authority (NDTA, 2005)
- ▶ South Dakota Energy Infrastructure Authority (SDEIA, 2005)
- ▶ Colorado Clean Energy Development Authority (CEDA, 2007)
- ▶ New Mexico Renewable Energy Transmission Authority (RETA, 2007)



As a rule, these states are rich in potential generation resources and have a desire to develop these resources for export to other states.

Characteristics:

The state infrastructure authorities have various different requirements and capabilities based on the design characteristics incorporated into their respective legislations.

	Issues Revenue Bonds	Cap on Bonding Amount	Can Own Facilities	Can Operate Facilities	Required to Divest facilities	Required to Give Public Notice	Power of Eminent Domain within Their States
CEDA	√						√
IERA	√		√	√	√#		√
KETA	√*		√			√	√
RETA	√		√+			√	√
NDTA	√	√	√	√	√	√	√
SDEIA	√	√	√	√	√		√
WIA	√	√^	√&	√&		√	√

* Contracts with Kansas Development Finance Authority for the bonds.

IERA must partner with a utility or IPP and they can request that IERA divest a facility.

^ Cap only applies to bond issuances for private sector projects, not for WIA's own projects.

+ Must be leased to another entity.

& Policy preference is not to own and operate facilities.

National Renewable Energy Laboratory

NRDC is recommending that a State Transmission Planning Authority focus mainly on facilitating a single transmission plan for the state's grid and requiring interconnections and coordinated control between and among its five BAAs and states and provinces in the Western Interconnection.

Recommendation: Require better balancing authority coordination to enhance reliability and reduce the need for duplicative peaking generation and transmission.

As noted above, one of the biggest advantages of collaborative planning and operation is system balancing. There is no coordination between POUs and IOUs in terms of operational coordination in the system today. This is a major failing, increasing electricity costs for all California consumers as separate systems are constructed and operated with little consideration toward avoiding unneeded generation and transmission resources.

If the state's grid— across balancing authorities — was interconnected and coordinated we would need far less fossil generation to back up variable renewable energy and we could make better use of transmission resources and need to build less. For this to happen, the state's public owned utilities would need to connect and directly coordinate their system balancing with the ISO. Wind from the Tehachapi generally comes onto the grid at night. Solar resources in the Mohave or the as yet untapped southern San Joaquin will enter the system during daylight hours. Desert solar thermal with gas back-up or thermal storage can operate for a time after the sun sets while photovoltaic — absent bulk electricity storage — presently cannot. The PG&E Helms pumped storage facility could store Tehachapi wind and smooth out the variability of some large scale and distributed solar. Geothermal Resources in Imperial County could provide stable power throughout the entire day. Thus renewable power from one source and geographic location could reduce the variability of resources from another technology in another location. California's conventional power fleet is more flexible than many states because it is principally comprised of natural gas resources. Many gas plants can ramp up or down more flexibly than can coal plants. The capacity factor for California natural gas plants

averages around 30%. There is plenty of *existing* capacity that could be devoted to flexibility services for renewables. That makes them a good match for variable renewable power. But POU's, as noted above, avoid placing their lines under ISO control at all costs. A Transmission Planning and Operations Authority could fill this coordinating role and participate in the broader Federal Energy Regulatory Commission Order 1000 planning process for interstate transmission planning, cost allocation and the integration of variable renewable generation. California could then begin to receive the benefits of balancing renewable generation across the West as part of a *de facto* regional energy market.

Recommendation: California should encourage and participate in regional renewable energy market and balancing activities, such as the proposed western Energy Imbalance Market.

California cannot achieve its goal of reducing climate change impacts alone. We are part of a broader regional energy market – albeit an unofficial one – in which resources from as far away as Wyoming and British Columbia contribute resources to meeting our energy load. As our population increases and the economy begins to expand again the benefits of fully participating in the Western Interconnection energy market will become increasingly important to our state.

We can both import and export renewable power (we are not just an energy sink). We also have the potential to provide grid reliability services to and receive them from neighboring states. There are seasonable characteristics to generation facilities in the larger region that enable us to take maximum advantage of our state's grid. Utilities that are part of the Columbia Grid subregional planning group in the Pacific Northwest would like to import California solar generation in summer months even as they provide hydro balancing resources in the fall and winter to California, for example. Northern Plains wind resources seasonably complement solar resources in the Southwest, including our own. Their wind generation profiles match California wind profiles, enabling us to aggregate their combined variability and make their operation more stable and easier to manage. This balancing effect can accelerate the retirement of regional coal resources which might otherwise be seen as needed for reliability reasons, and reduce the need for fossil backup generation across the broader region. Some natural gas peaking will still be needed to address variability, but far less than if every balancing authority were to provide their own flexibility resources. As the region's largest market and the only regional transmission organization (CAISO) California can profoundly influence efforts to coordinate procurement and grid optimization efforts across between and among western states.

The Transmission Planning and Operations Board proposed above could facilitate a coordinated state policy agenda to take advantage of these regional benefits and coordinate state participation at the WECC and WGA

Recommendation: Focus planning on system benefits that reduce the cost of resource integration for all California consumers.

Our current balkanized planning process makes it difficult and more costly than is necessary for integrating renewable energy resources. For the last several years we have been stuck in a process based on sequential and clustered interconnection requests for the IOU's and a separate POU interconnection process. Access to resource integration assets like the Helms Pumped Storage facility, currently underutilized due to transmission limitations, is not given priority in

statewide transmission planning. Transmission that can free up integration resources such as Helms can be overlooked or not fully valued. The benefits of Helms described in this PG&E slide are ideal for renewable resource integration.

Helms Provides PG&E Customers with Many Benefits

- Storage of economy energy, or surplus or lower cost energy that is sometimes available at night for daily cycling or during Spring runoff conditions for seasonal storage
- A large amount of fast acting spinning reserve and regulation capability, or generating capacity that is immediately available to meet fluctuations in electric demand
- Revenues from CAISO's energy and ancillary markets (regulation, spin and non-spin)
- Helps alleviate over-generation or minimum load condition by using excess energy to pump water into storage
- Allows operation of thermal plants at a more steady output level, resulting in higher efficiencies
- Reduces dependence on fossil fuels and greenhouse gas emissions (environmental benefits)

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Future resources (such as battery and flywheel electricity storage) are also very valuable and reduce both the costs and CO2 emissions associated with renewable resource integration. This is because fewer fossil reserves would be needed for flexibility and voltage regulation. Having a more coordinated planning process that treats the statewide grid as an integrated whole enables us to get the most out of existing resources and to strategically locate new ones. Because fewer resources can be exploited more efficiently, the footprint of these resources is reduced as is the overall emissions profile. Because they benefit the entire system as a whole, costs could be allocated to load statewide, reducing the cost for ratepayers of any of the state's individual load serving entities. The alternative – each BAA meets its own needs – is duplicative, wasteful, environmentally destructive and expensive.

A word about variability: there already exists a great amount of variability in our electricity supply-demand system. All generation is variable but electricity load – the consumption of electricity in all sectors of our economy – is intrinsically variable. Therefore flexibility resources from all types of generation and storage technologies are needed in our system to keep the grid balanced, reliable and stable. Renewable energy generation, because its variability can be forecast and can be utilized to offset variability from other resources, can help solve this problem. Load variability (such as increased use of air conditioning in hotter weather) can also often be forecast in a way similar to how we forecast the availability of renewable resources. What is required is a grid planned to facilitate the use of flexible resources and storage technologies, and aggregate variability in generation resources of all kinds.

In conclusion, NRDC believes that while agency coordination has been improving in California on transmission planning, the process remains unwieldy, and results in duplicative, expensive and environmentally damaging infrastructure being proposed and developed. A state authority to coordinate planning and require better grid optimization and stakeholder involvement would make renewable energy integration cheaper, faster, more reliable and more

easily accepted by the full range of stakeholders who would have a meaningful and manageable voice in determining which resources would be approved and where they would be located.

Thank you for your consideration of these comments.

A handwritten signature in blue ink that reads "Carl Zichella". The signature is fluid and cursive, with the first name "Carl" and last name "Zichella" clearly distinguishable.

Carl Zichella
Director of Western Transmission
NRDC